

WHAT IS CLAIMED IS:

1. A method for transmitting an Orthogonal Frequency Division Multiplexing (OFDM) symbol in an OFDM communication system, the OFDM
5 symbol including a guard interval and a data interval, the method comprising the steps of:
 copying data at a predetermined interval in a data row inputted to be transmitted;
 filling the copied data and unique words in the guard interval and filling
10 the data row in the data interval, the unique words having a constant amplitude and a non-periodic auto-correlation characteristic; and
 transmitting the OFDM symbol comprised of the guard interval and the data interval filled with the unique words and the data row.
- 15 2. The method as claimed in claim 1, wherein the guard interval is located before the data interval.
3. The method as claimed in claim 1, wherein the guard interval includes a first interval and a second interval continuing in sequence, the unique
20 words being filled in the first interval, the copied data being filled in the second interval.
4. The method as claimed in claim 1, wherein the guard interval includes a first interval and a second interval continuing in sequence, the copied
25 data being filled in the first interval, the unique words being filled in the second interval.
5. The method as claimed in claim 1, wherein the guard interval includes a first interval, a second interval, and a third interval, which are
30 continuing in sequence, a portion of the copied data being filled in the first

interval, the unique words being filled in the second interval, a remaining portion of the copied data being filled in the third interval.

6. The method as claimed in claim 1, wherein the unique words are
5 a pilot data row.

7. A method for generating an OFDM symbol for transmission in an OFDM communication system, the method comprising the steps of:

copying data at a predetermined interval in a data row inputted to be
10 transmitted;

generating a first guard interval symbol in which unique words are filled, the unique words having a constant amplitude and a non-periodic auto-correlation characteristic;

generating a second guard interval symbol in which the copied data are
15 filled;

generating a data interval symbol in which the inputted data row is filled; and

generating the OFDM symbol, which is comprised of the first guard interval symbol, the data interval symbol, and the second guard interval symbol.

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8. The method as claimed in claim 7, wherein the predetermined interval at which the data are copied is located at a foremost portion of the inputted data row.

25 9. The method as claimed in claim 7, wherein the unique words are a pilot data row.

10. A method for generating an OFDM symbol for transmission in an OFDM communication system, the method comprising the steps of:

30 copying first data at a first interval and second data at a second interval

in a data row inputted to be transmitted;

generating a first guard interval symbol in which unique words are filled, the unique words having a constant amplitude and a non-periodic auto-correlation characteristic;

5 generating a second guard interval symbol in which the copied first data are filled;

generating a data interval symbol in which the inputted data row is filled;

and

generating a third guard interval symbol in which the copied second data
10 are filled;

generating the OFDM symbol, which is comprised of the first guard interval symbol, the second guard interval symbol, the data interval symbol, and the third guard interval symbol.

15 11. The method as claimed in claim 10, wherein the inputted data row is divided into a first data row and a second data row continuing in sequence, and the first interval at which the first data are copied is located at a rearmost portion of the first data row.

20 12. The method as claimed in claim 10, wherein the inputted data row is divided into a first data row and a second data row continuing in sequence, and the second interval at which the second data are copied is located at a foremost portion of the second data row.

25 13. The method as claimed in claim 10, wherein the unique words are a pilot data row.

14. An apparatus for transmitting an OFDM symbol in an OFDM communication system, the OFDM symbol including a guard interval and a data
30 interval, the apparatus comprising:

a guard interval filling means for copying data at a predetermined interval in a data row inputted to be transmitted, and filling the copied data in the guard interval set in advance in the input data row; and

a selection means for selectively receiving an output data row outputted
5 from the guard interval filling means and unique words having a constant amplitude and a non-periodic auto-correlation characteristic, and outputting the OFDM symbol in which the unique words are inserted in the output data row.

15 15. The apparatus as claimed in claim 14, further comprising:
a buffer for storing the unique words; and
a control unit for controlling selective input operation of the selection means.

16 16. The apparatus as claimed in claim 14, wherein the guard interval
15 is located before the input data row.

17. The apparatus as claimed in claim 16, wherein the unique words are located before the guard interval.

20 18. The apparatus as claimed in claim 16, wherein the unique words
are located after the guard interval and before the input data row.

19. The apparatus as claimed in claim 16, wherein the unique words are located in a middle portion of the guard interval.

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20. The apparatus as claimed in claim 14, wherein the guard interval is located after the input data row.

21. The apparatus as claimed in claim 20, wherein the unique words
30 are located before the input data row.

22. The apparatus as claimed in claim 14, wherein the guard interval has two portions, one portion located before the input data row and the other portion located after the input data row.

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23. The apparatus as claimed in claim 22, wherein the unique words are located before the guard interval.